

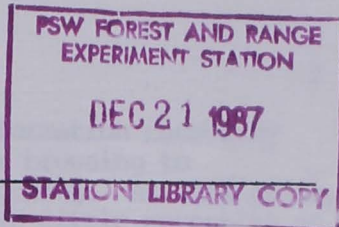
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UNITED STATES
DEPARTMENT OF
AGRICULTURE

FOREST
SERVICE

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REPLY TO: 3420

DATE: July 28, 1987

SUBJECT: Biological Evaluation of the Shovel Grave Plantation,
Calaveras Ranger District (Rept. No. 87-12)

TO: Forest Supervisor, Stanislaus National Forest

At the request of Duncan Wurm, Calaveras Ranger District Culturist, Forest Pest Management examined the Shovel Grave Plantation on June 25, 1987. Entomologist Dave Schultz and plant pathologist John Kliejunas were accompanied by Duncan; by Mike Brown, Forest Silviculturist; and by Mike Rutty, Assistant Forest Silviculturist. The objective of the evaluation was to determine the cause of damage to trees in the plantation and to provide a prognosis for potential impact of the problem in the area examined.

The 19-acre Shovel Grave Plantation is on a north-facing slope and was planted with ponderosa pine, Jeffrey pine, sugar pine, and some white fir in 1979. The plantation is scheduled for manual release this year. Symptoms of damage observed on all species included dieback of terminal leaders, yellowing or necrotic needles on last year's growth, and dropping of second and third year needles. Current year's growth had flushed about three weeks previously and was generally unaffected. Symptoms were more severe on ponderosa pine than on Jeffrey pine, and only moderate to slight on sugar pine and white fir. Symptoms generally occurred on the east to south-facing sides of the trees. A scorching or burning of last year's growth also occurred on incense-cedar and white thorn. Dieback from past years, evidenced by multiple tops, and some damage from deer and cattle browsing, were also observed. Some sugar pines were lethally infected with white pine blister rust (Cronartium ribicola).

Symptoms indicated that winter drying was the cause of most of the damage. Winter drying, a form of drought damage, is due to the loss of water from the foliage under conditions where its replacement from the soil is difficult or impossible because of frozen ground. Increased damage occurs when days are warm enough to promote transpiration without replenishment because the roots are in frozen ground. Winter drying is particularly likely to occur in places like Shovel Grave Plantation where trees are exposed to east or northeast winds, and are on hilltops.

Some of the ponderosa pines in the plantation have forks or multiple tops, which indicates that winter drying has probably occurred in the past. The condition of natural saplings in the area suggests that winter drying will cease to be a problem when the trees reach a height of 8 to 10 feet. The reason for a decrease in damage to larger trees is unknown, but it may simply be that larger trees have more extensive root systems which occupy unfrozen soil. Because it will be at least several years before the plantation trees are 8 to 10 feet, it would be reasonable to anticipate one or more additional episodes of winter drying.





It appears that enough trees will escape mortality and deformation caused by winter drying, white pine blister rust, and cattle or deer browsing to eventually produce a plantation which is above minimum stocking. At this point, it is obvious that some of the trees in the plantation have little potential as crop trees. Unfortunately, it appears to be too early to identify all of the trees which will become crop trees. Because there will be some uncertainties about the plantation during the next few years, the conservative approach would be to avoid significant investments.

A manual release treatment is being considered for part of the plantation which is accessible. There is a fairly small amount of mountain whitethorn present, which doesn't appear to be having a large effect on tree growth. Manual release could theoretically shorten the length of time until the crop trees can be identified. The actual change in survival and growth is likely to be small enough, however, that manual release would make sense at this point only if done to accomplish other targets.

Management Alternatives identified are:

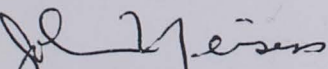
1. Do nothing. There will probably be another episode or two of winter drying, and some additional sugar pine will become infected with white pine blister rust. In another 4 to 10 years, some trees will be much less susceptible to winter drying and browsing. An adequately stocked, commercial size stand will eventually result.

2. Manual release. There would be a small reduction in the amount of competing vegetation on the site. The direct effects on survival and growth would be low. There may be an indirect effect of reduced cattle browsing if enough vegetation is removed to make the area unattractive to cattle. If a reduction in browsing occurs, the greatest benefit would probably be to white fir and incense-cedar.

3. Restrict cattle grazing. A reduction in cattle grazing for the next few years would allow white fir and incense-cedar to increase much more in height. It would also prevent some leader damage and trampling injury to the boles of pines. An optimistic estimate of the benefits is that a reduction in damage caused by cattle grazing could shorten the rotation by five, or fewer, years. Because the benefits are difficult to quantify, it could be hard to justify an immediate reduction of grazing benefits or possible increased administrative expense.

4. Remove lethally infected sugar pine. Lethally infected sugar pines may remain alive for years and compete with potential crop trees. Removal of the lethally infected trees may reduce vegetative competition almost as much as manual release from whitethorn, and would produce more lasting results because the sugar pine won't sprout after being cut. This activity will have no effect on the future spread or intensification of the disease in the plantation.

If you have any questions, please contact my Staff at 415-556-6520.



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